



Multi-proxy record of past environmental changes from a tropical peatland (Kyambangunguru, Tanzania)

Sarah Coffinet, Arnaud Huguet, Nikolai Pedentchouk, Christelle Anquetil, David Williamson, Laurent Bergonzini, Amos Majule, Fatima Laggoun-Défarge, Thomas Wagner, Sylvie Derenne

► To cite this version:

Sarah Coffinet, Arnaud Huguet, Nikolai Pedentchouk, Christelle Anquetil, David Williamson, et al.. Multi-proxy record of past environmental changes from a tropical peatland (Kyambangunguru, Tanzania). EGU General Assembly 2015, Apr 2015, Vienne, Austria. insu-01294635

HAL Id: insu-01294635

<https://insu.hal.science/insu-01294635>

Submitted on 29 Mar 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Multi-proxy record of past environmental changes from a tropical peatland (Kyambangunguru, Tanzania)

Sarah COFFINET (1), Arnaud HUGUET (1), Nikolai PEDENTCHOUK (2), Christelle ANQUETIL (1), David WILLIAMSON (3), Laurent BERGONZINI (4), Amos MAJULE (5), Fatima LAGGOUN (6), Thomas WAGNER (7), and Sylvie DERENNE (1)

(1) Université Pierre et Marie Curie, CNRS, METIS, Paris, France, (2) University of East Anglia, Norwich, United Kingdom, (3) IRD, LOCEAN, Bondy, France, (4) Université Paris Sud, GEOPS, Orsay, France, (5) IRA, University of Dar Es Salaam, Dar Es Salaam, Tanzania, (6) ISTO, CNRS, Orléans, France, (7) Newcastle University, Newcastle-upon-Tyne, United Kingdom

Tropics play a key role in the atmospheric circulation, partly responsible for the variations of climatic conditions, as they are a major source of heat and water vapour on Earth. Thus, improving our knowledge on past temperature fluctuations and hydrological regimes in these areas may allow to better constrain the driving forces controlling climate system. Peatlands are important archives for the reconstruction of past environmental changes because of their high rates of peat accumulation due to the low rate of plant litter decomposition. The aim of this study was to reconstruct past environmental changes via the high-resolution analysis of several proxy/climate indicators along a 4 m peat core collected in SW Tanzania and covering the last 4,000 years (based on ^{14}C dating).

The core was collected at Kyambangunguru (663 m asl) in a Maar lake system having been filled up by ombrotrophic peat. The evolution from a lake to a peat bog is a frequent phenomenon in Maar lakes of this region; however, the potential role of climate in this process remains unclear. In order to track when and why this conversion occurred, a multi-proxy approach involving elemental, molecular (GDGTs, n-alkanes), isotopic ($\delta^2\text{H}$) as well as macro- and microscopic (macro-rests, micro-fossils, palynofacies and pollen) analyses was applied along the core collected at the centre of the Kyambangunguru peat bog.

This multi-proxy approach provided us with an opportunity to study climate and vegetation changes along the core. Macro- and Microscopic observations revealed that the ecosystem likely changed from a lake to a peat bog between ca. 2,300 and 1,500 years BP. During this time interval, molecular proxies and elemental analyses showed a major shift, in agreement with the establishment of a mire. The high C/N values indicated a low decomposition of the organic matter while the GDGT derived proxies showed more acidic and warmer climatic conditions. On the other hand, $^2\text{H}/1\text{H}$ of plant derived n-alkanes, which are linked to $2\text{H}/1\text{H}$ of precipitation and hydrological regime, do not exhibit any major shifts at the time of bog formation. This implies that neither the source of precipitation, nor the humidity level of the region underwent significant changes during the last 4,000 yrs. Thus, lake overgrowth with peat-forming macrophytes, rather than changes in local hydrology, was probably the main factor in the transition from a crater lake to a peat bog at the Kyambangunguru site.